Reprinted from *The Indian Medical Gazette*, Vol. XLI

(No. 6, June 1906).

A FURTHER NOTE ON IRRIGATION IN CATARACT EXTRACTION.

By R. H. ELLIOT, M.D., B.S. (Lond.), F.R.C.S. (Eng.), ETC.,

MAJOR, I.M.S.,

Superintendent of the Government Ophthalmic Hospital, Madras.

Reprinted from *The Indian Medical Gazette*, Vol. XLI
(No. 6, June 1906).

A FURTHER NOTE ON IRRIGATION IN CATARACT EXTRACTION.

By R. H. ELLIOT, M.D., B.S. (LOND.), F.R.C.S. (ENG.), ETC.,

MAJOR, I.M.S.,

Superintendent of the Government Ophthalmic Hospital, Madras.

In April 1903 I drew the attention of the readers of the *Indian Medical Gazette* to McKeown's method of irrigation in cataract extraction, by means of an article in these columns. Since then I have used the method in nearly 2,000 cases, and have been thus enabled to try many different departures from the ordinary technique, some of which have proved of great value, whilst others have been discarded as useless, or at least not worth while continuance in. At the present time, whilst so much attention is being devoted in these columns to the question of how best to extract a cataract, I trust I may be allowed to place my later experience with this method at the disposal of Indian surgeons. I desire to do so, in the hope of stimulating others to use irrigation as a routine step in cataract extraction. Increased

experience of the method has only served to heighten my opinion of its value, whilst it has taught me how much there may still be to learn in the details of its application.

At the same time those who, with fewer opportunities for using it, have given it a trial, have without exception testified to me of the value the method has been to them. There are not a few medical men in Southern India, who are now employing irrigation in cataract extraction.

The Toilet of the Iris and Capsule.

It will be freely admitted that one of the most important matters in the extraction of a cataract is the safe and thorough return of the iris and torn lens-capsule back into the chamber. This can only be carried out after the lens debris have been washed out in the usual way. There are several methods of attaining our end. I shall enumerate them in order of their ease of performance, which will naturally be also their order of preference :—

(1) *Irrigation under the lower margin of the iris*, by depression of the nozzle of the instrument after its introduction within the chamber. This serves also to wash out debris of lens from beneath the membrane, and for the latter purpose is a regular step in every operation. The iris bellies out, and is often carried bodily towards the lower part of the chamber, and away from the incision. Not infrequently, however, the opposite effect is produced, and the iris is washed out with the cortex, so that its edges prolapse in the wound.

(2) If the above manœuvre fails to return the iris, the nozzle of the irrigator should be withdrawn 2 or 3 mm. length from the incision

and *a gentle stream of fluid should be directed on the lips of the wound from outside.* The chamber will often fill at once, and the iris fall into place almost with a snap.

If reposition is still unaffected, it may be safely assumed that one of two things has happened. Either the iris is caught in the angles of the wound, or (and more commonly still) the membrane has been folded on itself and fixed there. The former accident will seldom occur to an experienced operator, for it is usually due to the iris being pulled on during iridectomy. If the hold of the iris-forceps on the membrane is a very light one, and if the iridectomy is quickly and cleanly made, it will very rarely happen that the pillars of the coloboma become impacted in the angles of the wound. Such an accident is the mark of slovenly or unskilled operating. The folding of the iris on itself is a much commoner complication, and one which it is often difficult to avoid. What happens is that the iris becomes thrown into folds during the exit of the lens, and that these folds become, as it were, gummed together by the sticky lens substance, or by some other means more difficult to explain. I frequently demonstrate to medical visitors and to students the unfolding of those iris creases under the influence of irrigation. One can watch the folds open, and the iris returning to its place with an action that suggests the unfolding of a fan, or that of a theatre curtain as it is dropped. This leads me to the third method, which consists of

(3) *Irrigating with the nozzle within the chamber, the stream being directed over the anterior surface of the iris,* instead of below it. One can reinforce this method by at the same time gently stroking the iris in the required direction with

the flat of the irrigator-nozzle. It will sometimes happen that an iris will tend to prolapse on the use of even the gentlest stream. This seems to be due to want of tone, and often yields to the steady flow of the fluid, the tone appearing to be regained. If this is not quickly the case, I proceed to the next method, *viz.*—

(4) *The reposition of the membrane with a curette,* after seeing the chamber has been washed clear. If all these means fail, and it is but seldom that they do so if properly used, there remains yet a very valuable method, *viz.*—

(5) *The replacement of the iris edges by seizing each in turn with carefully introduced iris-forceps, and pulling them in the required direction.* A sharp key-hole pupil at once succeeds to the bow-like curve of the iris, or to the upward displacement of the pupil, either or both of which indicate a failure in proper replacement of the membrane.

It will seldom be difficult to replace the iris satisfactorily, if one is careful (1) not to pinch the portion one picks up in the forceps, and (2) not to draw the membrane tightly into the sclero-corneal section. If the iris is pinched the patient experiences pain, and in consequence shrinks away, and by so doing draws the iris tight into the section. An operator who has not acquired the light touch which renders him independent of support for his hands, may easily do the same thing, even in a quiet patient. My routine practice is to perform an iridectomy in every cataract extraction; a small piece of the pupillary margin of the iris is seized gently, and withdrawn from the chamber, without tugging on it at all; a section is then made with scissors at right angles to the wound, a small segment being cut off cleanly with one cut. If the

membrane does not at once fall back into the chamber in its proper position, I wash it back with the irrigator, before commencing extraction; this saves such a case from impaction of the iris in the wound-angles. If the iris does not readily return, I use the nozzle of the irrigator as a curette to replace it, or introduce a curette for the purpose. In some cases after delivery of the lens, it may be found that the iris will not wash back; on carefully examining the wound, the cause of this may be at once revealed in the impaction of a mass of cortex under the scleral lip of the corneo-scleral wound. Such a mass will most often be left behind, when we are dealing with lenses, in which a firm nucleus is surrounded by a layer of cortex of a doughy or cheesy consistency. As the lens dislocates upwards, and tilts its upper edge forward for delivery, it may happen that the edge of the nucleus more nearly corresponds with the gap of the incision, than does the actual upper edge of the lens. A fracture takes place in the lens at the level of junction of the nucleus with cortex above, and the upper margin of the nucleus becomes the leading point of the delivering lens, whilst the brittle cortex strips off above and remains impacted under the scleral edge of the sclero-corneal wound. I think I am right in saying that the capsule is invariably left behind at the same time. Very often when the latter cannot at first be seen, it is at once obvious on filling the chamber with fluid from the irrigator. The mass of impacted lens-matter may in very many cases be easily got rid of, and the iris at once replaced by the following manœuvre:—

(6) *The irrigator-nozzle is turned round so that the stream is directed backwards, or even upwards and backwards, thus playing direct*

on the impacted mass. Very often this at once suffices to wash out the obstruction, and the iris easily slides into position, as soon as the stream is again directed over its surface in the usual direction. If this is not the case we may next proceed to another manœuvre, which, however, I only recommend to those who are confident of their skill, as the result of considerable practice.

(7) *A pair of iris-forceps being introduced into the chamber, one seizes a portion of the capsule, which can be seen hanging down into the chamber, and draws it towards the centre of the pupil.* By so doing, one everts the shallow bag formed by the upper cul-de-sac of the capsule, and thereby empties its contents (cortical matter) free and loose into the chamber, from which they can be easily washed out. At once the impaction of the iris is relieved, and the membrane can be easily returned into position. Very often, when the impacted capsule cannot easily be seen, one can, as already stated, render it patent by gently irrigating the chamber; the flapping fragments of the torn capsule at once become obvious, and are easily seized. In recent extractions, I have been resorting to this manœuvre with increasing frequency.

When dealing with Morgagnian cataracts, or with cataracts in which the cortical matter is abundant and soft, it is my practice to wash out the whole lens (nucleus and all) with the irrigator. As soon as the iridectomy has been made, all instruments save the irrigator (the speculum excepted) are laid aside, and a stream of fluid is directed into the chamber behind the lens. At once the whole cataract washes out (nucleus and cortex) with the least possible disturbance to the eye; for the even hydrostatic

pressure reduces the risks of delivery to a minimum. It is a most fascinating manœuvre to watch or to perform.

Peripheral Iridectomy.

A free trial was given to partial iridectomy. Instead of making the usual complete section of the iris, one seized only the peripheral edge with the forceps, withdrew it from the chamber, and cut out the peripheral portion of the membrane, leaving the pupillary ring with the sphincter intact. The cases did well, and in those one was able to follow, the result was satisfactory; a very active pupil was left, while the main advantage of iridectomy was attained, inasmuch as a free sluice gate was provided for the escape of out-rushes of aqueous fluid, on any rupture of the section. There proved, however, to be disadvantages, which for busy Indian practice at least more than counterbalanced the advantages. It was much more difficult to wash the chamber clear, and this lavage took much longer than with a complete iridectomy. Moreover, the pupillary bridge of iris prevented the easy escape of the lens, and was sometimes broken during expulsion. I have dropped this manœuvre in consequence.

I have already emphasised the advantages of irrigation in enabling us to deal with a falling in of the cornea on the one hand and with the presence of troublesome air-bubbles in the anterior chamber on the other, and I need not further dilate on the subject The advantages are too obvious to any one who has had any experience of cataract extraction. (Vide *I. M. G.*, April, 1903.)

Irrigation as a routine step in Iridectomy.

For whatever purpose an iridectomy is undertaken, I invariably use the irrigator as a matter of routine. As soon as the iris section has been made, the nozzle of the instrument is introduced and a gentle stream is poured into the chamber. At once the iris falls back into place, and blood is easily and quickly washed out. Moreover, as in cataract extraction with the use of this instrument, the operation closes on a full chamber, and enables the surgeon to see that his section edges are in good apposition. It is no small advantage to substitute the even hydrostatic pressure of a sterilised normal saline solution for the introduction into the chamber of various instruments. Need I dilate on the advantage of working with a clear chamber which permits every detail to be easily seen, instead of groping to replace an iris which is hidden by a quantity of blood ?

Cleansing a cloudy chamber.

It not infrequently happens that during the course of an extraction lens debris or blood escapes into the chamber, and renders the field of operation obscure. If the lens presents easily, this is not a matter of much consequence, as the disturbing matter is usually expelled with the cataract; unfortunately this clouding of the chamber is most likely to occur when for one reason or another the lens is not easily expelled. It is one thing to have to decide what it is best to do, when the details are thus obscured, and quite another, when by means of a few seconds' irrigation, the whole field lies plain before one. It can at once be seen, for instance, that the section has been made too small, or that the lens

has dislocated upwards and laterally, and these defects can at once be remedied, with all the advantages attendant on clear vision. It seems hardly necessary to point out that if the lens happens to have dislocated upwards and inwards, or upwards and outwards, the direction we will have to apply our pressure to replace it, before delivery can be effected, will be different in the two cases; to attempt to replace it in the wrong direction will only lead to disaster, whereas a few moments suffice with properly applied pressure (personally I usually use a needle for the purpose) to right the dislocation, and clear the path for easy delivery.

The Preparation of the Eye.

Since writing my paper in 1903, I have in several respects altered my methods. Each such alteration has been made after very careful deliberation.

All my instruments are now boiled.

The knife, needle and scissors are wiped clean, after each operation, and their points are then plunged under boiling water for one minute. They do not seem to suffer thereby. One pair of scissors lasts me for more than 100 cataracts, and one knife or needle for 20 to 40 operations. The remaining instruments are boiled, as before, for five minutes between each two operations. My dressings are sterilised in an autoclave, and I have discarded the use of antiseptics.

The eye is closed for 12 hours before operation with a sterilised pad and bandage. If on opening it, the secretion proves to have been excessive, or the conjunctiva is congested, the patient is put off for a week or more, as the case may be. Very great stress is laid on the preparation of the

conjunctiva, and cases are detained under treatment weeks or even (rarely) months, if necessary. Every case is carefully examined for diseases of the lachrymal apparatus. Dacryocystitis is treated with extirpation of the sac. In cases of old-standing obstruction, in which there is no collection in the sac, and the passages are shrunken, I am content to obliterate the canaliculi with a pointed cautery, after having slit them up half way, in order to secure a sufficient raw surface of contact.

I have given up chinosol solution, and use boiled water. I am convinced that the eye-surgeon's motto should be "*Asepsis, not Antisepsis.*"

As each patient comes on the table, his eye is carefully cleansed in the following way:—A number of small sticks, 5 inches long, and as thick as a thin mapping pen are mounted with small swabs of cotton-wool, and then sterilised in the autoclave; thence they are transferred into a sterilised tin box, and thence again, just before operation, into sterilised boric acid solution in a bowl. An aluminium vessel, shaped like a tea-pot with a long spout is used for irrigation. I elevate the upper lid with my left hand, and use a swab in my right, while an assistant pulls down the lower lid with one hand, and pours in a stream of the sterilised boric lotion into the conjunctival sac from the "tea-pot" with the other. *Every part of the conjunctival sac* is thoroughly cleansed. At first each swab comes out coated in most cases with slimy mucus. After a few swabbings, the mucus is all removed, and with it, no doubt, a large number of bacteria, which constitute a menace to the success of the operation. The idea was suggested to me by Major Herbert's perchloride

treatment. It has this advantage over the latter that it does not cause any reaction afterwards, though often painful at the time. I am not aware of any other writer beside Major Herbert who has drawn attention to the dangers of this mucus, and yet it occurs in considerable quantity in nearly every eye, and obviously calls for removal, before a major operation is undertaken. I tried the perchloride method and abandoned it as I found it set up a marked congestion of the eye. The method I now advocate has all the advantages of Major Herbert's method, without setting up any irritation.